PH-2395PCT (IDS)

Difference between the present invention and similar art

Similar art

In the field of bar code recognizing technologies, methods for extracting a 2-dimensional code region existing in an image have been proposed as follows.

Patent Document 1: JP Patent Publication (Kokai) No. 2000-293615 A

Scanning is performed not just in the same direction but also in the opposite direction alternately, so that the need to scan the entire width of the image is eliminated and required time can be reduced. Upon detection of a point of change in pixel values during the scan, a line with a certain width is detected and an L-shape, which is characteristic of a 2-dimensional code, is detected. In this way, the 2-dimensional code existing region is narrowed down.

Patent Document 2: JP Patent Publication (Kokai) No. 2001-22881 A

Image data is divided into uniform small blocks, each of which is briefly scanned so as to calculate its level of complexity, which refers to the number of times that a gradation difference exceeding a threshold value is detected. Generally, the level of complexity increases as the probability of presence of a 2-dimensional code in a block increases. From this standpoint, the individual blocks are scanned in order of decreasing level of complexity so as to read a 2-dimensional code.

Difference from the present invention

In accordance with the invention, an image is scanned at predetermined intervals (as calculated based on the minimum number of pixels of which a 2-dimensional code can be composed, which depends on camera performance), and blank space portions (quiet zone) having a width not smaller than a predetermined width that exists around a 2-dimensional code is detected. Such scan is performed vertically and horizontally, and a region in which a 2-dimensional code

1

exists is extracted based on the relationship between the position and distance of the blank space portions. When there are multiple regions as candidates, the number of similar candidates is calculated based on the position and size and they are ranked.

In the method of Patent Document 1, scanning is performed from either end of the image alternately, so as to detect the L-shape of the 2-dimensional code. However, in accordance with the present invention, blank space portions are detected by the vertical and horizontal scanning. Thus, the detected object and the method of scanning are different.

In the method of Patent Document 2, the image data is divided into regular small blocks, and each block is scanned briefly so as to calculate the level of complexity (the number of times a gradation difference exceeding a threshold is detected). In accordance with the present invention, blank space portions are detected by the vertical and horizontal scanning, where no division into blocks is involved. Further, the ranking is determined based on the position and size of candidate regions, which is different from the method of calculating the level of complexity.